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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/982,317	10/18/2001	Amab Das	12-16	6605
30594	7590	06/01/2005	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			MERED, HABTE	
P.O. BOX 8910			ART UNIT	
RESTON, VA 20195			PAPER NUMBER	
			2662	
DATE MAILED: 06/01/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/982,317	YUANG ET AL	
	Examiner	Art Unit	
	Habte Mered	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>03/04/03, 08/16/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Amended claim1** is rejected under 35 U.S.C. 102(e) as being anticipated by Koorapaty et al (US 6, 631, 124).

Koorapaty discloses a method and apparatus for allocating resources in hybrid TDMA communication Systems.

3. Regarding **currently amended claim 1**, Koorapaty discloses a method for transmitting information in a communication channel of a wireless communication system, the method comprising:

dividing the communication channel into a plurality of time slots of equal duration

(See Figure 5A and Column 6, Lines 18-43; In Figure 5A for a given carrier frequency there are three equal time slots 510 shown in Figure 5A)

and sub-dividing, on other than a time division basis, each of the plurality of time slots to comprise two or more sub-slots, wherein each of the two or more sub-slots is capable of carrying a separate transmission within the communication channel and wherein a transmission within the communication channel is

capable of being carried in a variable number of contiguous sub-slots and a variable number of contiguous time slots. **(See Figure 5B, and Column 6, Lines 18-43; Koorapaty discloses in Figure 5B that an entire time slot 510 or a spreading code defined sub-channel 520a – 520n define variable number of contiguous time slots 510 and variable numbers of contiguous sub-slots in time slot 520.)**

4. Regarding **original claim 2 and amended claim 16**, Koorapaty discloses a method, wherein each of the two or more sub-slots within a particular time slot is separately transmitted according to a code division multiple access schemes. **(See Column 6, Lines 24-26)**

5. Regarding **original claim 3**, Koorapaty discloses a method wherein, in any one of the plurality of time slots, each of a plurality of transmissions are separately coded and carried in a separate sub-slot simultaneously in such time slot. **(See Column 6, Lines 24-26)**

6. Regarding **original claim 4**, Koorapaty discloses a method wherein each of the plurality of transmissions corresponds to a separate user of the wireless communication system. **(See Figure 5A; Terminals 1 to N constitute separate users in the system. See Column 6, Lines 24-26)**

7. Regarding **original claim 5**, Koorapaty discloses a method wherein each off the plurality of transmissions correspond to separate transmissions of a single user of the wireless communication system. **(See Figure 5A; Terminals 1 to N constitute single users in the system. See Column 6, Lines 24-26)**

8. Regarding **amended claim 7**, Koorapaty discloses a method, wherein a single transmission can be carried in one or more contiguous sub-slots in one or more contiguous time slots. **(See Figure 5B, and Column 6, Lines 39-43)**

9. Regarding **original claim 8**, Koorapaty discloses a method, wherein the communication channel comprises time slots each having duration of 1.25 milliseconds and wherein each of the time slots comprises at least two sub-slots. **(Koorapaty discloses in Figure 5B and further on Column 6, Lines 39-43 that each time slot can have several sub-channels. There is no restriction imposed on the duration of the time slot and can readily be 1.25 milliseconds.)**

10. Regarding **original claim 9**, Koorapaty discloses a method, further comprising: transmitting a separate control channel for each separate transmission carried in the communication channel. **(This is basic to all multiple access communications and Koorapaty discloses the DCCH as the control channel and the RACH as the traffic channel. See Column 6, Lines 61-67.)**

11. Regarding **amended claim 14**, Koorapaty discloses a method for transmitting information in a communication channel of a wireless communication system, the method comprising:

dividing the communication channel into a plurality of time slots of equal duration according to a time division multiple access scheme **(See Figure 5A time slots 510; Column 3, Lines 20-35)** and

sub-dividing each of the plurality of time slots to comprise two or more sub-slots

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according to a code division multiple access scheme (**See Figure 5B time slot 520 subdivided into 520a to 520n; Column 3, Lines 20-35**),

wherein each of the two or more sub-slots is capable of carrying a separately coded transmission within the communication channel so that multiple simultaneous transmissions can occur in any given time slot, and wherein a transmission within the communication channel is capable of being carried in a variable number of contiguous sub-slots and a variable number of contiguous time slots. (**See Column 3, Lines 20-35 and Column 6, Lines 20-45.**)

12. Regarding **currently amended claim 15**, Koorapaty discloses a method for transmitting information in a communication channel of a wireless communication system, the method comprising:

time multiplexing a plurality of time slots of equal duration in the communication channel; and code multiplexing two or more sub-slots within each of the plurality of time slots, wherein a transmission within the communication channel is capable of being carried in a variable number of contiguous sub-slots and a variable number of contiguous time slots. (**See Figures 5A and 5B; See Column 3, Lines 20-58; and Column 6, Lines 18-45**)

13. Regarding **new claim 17**, Koorapaty discloses a method, wherein bandwidth in the communication channel is allocated on a fractional basis to carry a plurality of transmissions using a combination of a variable number of contiguous sub-slots and a variable number of contiguous time slots. (**See Figures 5A and 5B; See Column 3, Lines 20-58; and Column 6, Lines 18-45**)

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. **Original claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Koorapaty et al (US 6, 631, 124) in view of Toskala et al (US 6, 535, 503).

Koorapaty disclosed the aforementioned invention but failed to disclose a method, wherein each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) scheme.

Toskala like Koorapaty discloses a method and apparatus for allocating resources in hybrid TDMA communication Systems. The hybrid TDMA system primarily described by both Toskala and Koorapaty is TDMA/CDMA.

Toskala shows that TDMA/FDMA is feasible. (See Column 1, Lines 40-50)

It would have been obvious to one of ordinary skill in the art at the time of invention to practice FDMA/TDMA access in Koorapaty's method. One is motivated to use TDMA/FDMA in GSM systems as it is widely used in the international wireless market and GSM access method is based on both FDMA and TDMA.

16. **Claims 10-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Koorapaty et al (US 6, 631, 124) in view of Tiedemann, JR. (US Pub. No. 2003/0039204), hereinafter referred to as Tiedemann.

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17. Regarding **original claim 10**, Koorapaty disclosed the aforementioned invention but failed to disclose a method, wherein the duration of the separate control channel is dependent upon the number of sub-slots carrying the corresponding transmission in the communication channel.

Tiedemann discloses a method and apparatus for Walsh space assignment in a communication system and in the process describes the IS-856 and IS-2000 standards developed by a consortium of companies in the industry. Tiedemann describes the 1xEV-DV proposal developed by the consortium and shows the relationship between the control channel and communication channel. (See Paragraph 10)

Tiedemann discloses a method, wherein the duration of the separate control channel is dependent upon the number of sub-slots carrying the corresponding transmission in the communication channel. **(Tiedemann discloses the control channel can be used to convey any information that will help in the better utilization of the traffic channel. See paragraph 34)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Koorapaty's method to incorporate IS-856 and IS-2000 standards, the motivation being complying to IS-856 and IS-2000 standards makes it interoperable with other vendors high data rate system products.

18. Regarding **original claim 11**, the modified invention of Koorapaty and Tiedemann as taught above disclosed the aforementioned invention including a method wherein the communication channel is a forward packet data channel (F-PDCH), wherein information is transmitted as encoder packets in the forward packet data

channel (F-PDCH), and wherein the separate control channel is a forward secondary packet data control channel (SPDCCH). **(See paragraphs 33 and 34. Tiedemann discloses the traffic/communication channel is F-PDCH and the control channel is F-SPDCCH.)**

19. Regarding **original claim 12**, the modified invention of Koorapaty and Tiedemann as taught above disclosed the aforementioned invention including a method, wherein the forward secondary packet data control channel (SPDCCH) includes:

a sub-slot start field for identifying a sub-slot within a time slot in which a particular transmission starts; and

a sub-slot count field for identifying the total number of sub-slots that carry the particular transmission. **(Tiedemann discloses the control channel (F-SPDCCH) can be used to convey any information that will help in the better utilization of the traffic channel. See paragraphs 33 and 34. The applicant's disclosure is within the spirit and understandings of Tiedemann's and the consortium disclosure.)**

20. Regarding **original claim 13**, the modified invention of Koorapaty and Tiedemann as taught above disclosed the aforementioned invention including a method, wherein a plurality of forward secondary packet data control channels (SPDCCH) correspond to a plurality of simultaneous transmissions on the forward packet data channel (F-PDCH), and wherein each of the plurality of secondary packet data control channels (SPDCCH) identifies a sub-slot start position within a time slot in which a particular transmission starts. **(Tiedemann discloses the control channel (F-SPDCCH) can be used to convey any information that will help in the better**

utilization of the traffic channel. See paragraphs 33 and 34. Based on IS-856 standard there can be one to one correspondence between the F-PDCH and the F-SPDCCH.)

21. **New claims 18 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Koorapaty et al (US 6, 631, 124) in view of Malkamaki et al (US 5, 577, 024), hereinafter referred to as Malkamaki.

22. Regarding **new claim 18**, Koorapaty disclosed the aforementioned invention but failed to disclose a method wherein transmissions within the communication channel include two or more transmissions selected from the group consisting of new transmissions, retransmissions, acknowledgements (ACKs), negative acknowledgements (NACKs), and multi-level ACK/NACK messages.

Malkamaki discloses a TDMA/CDMA system similar to Koorapaty but further incorporates Automatic Repeat request (ARQ) transmission scheme.

Malkamaki discloses a method wherein transmissions within the communication channel include two or more transmissions selected from the group consisting of new transmissions, retransmissions, acknowledgements (ACKs), negative acknowledgements (NACKs), and multi-level ACK/NACK messages. **(See Column 1, Lines 19-35; Column 3, Lines 65-67; and Column 4, Lines 1-17; Since Malkamaki's system supports ARQ and also like Koorapaty's system allows sub-slots in a given time slot, it is possible to have 4 users sharing the time slot. Each user in the sub-slot can be sending new transmission, Acks, Nacks and multi-level ACK/NACK).**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Koorapaty's method to incorporate orthogonal ARQ transmission, the motivation being implementing an error correction system for users in a TDMA/CDMA system.

22. Regarding **new claim 19**, the modified invention of Koorapaty and Malkamaki as taught above disclosed the aforementioned invention including a method, wherein a multi-level ACK/NACK message corresponds to multiple transmissions that end within the same time slot. **(See Column 1, Lines 19-35; Column 3, Lines 65-67; and Column 4, Lines 1-17; Malkamaki's system supports ARQ in an environment where multiple transmission within the same environment is allowed.)**

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patent is cited to show the state of the art with respect to ARQ in wireless networks:


US Patent (6, 625, 172) to Odenwalder et al

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571 272 3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HM
05-27-2005



KENNETH VANDERPUYE
PRIMARY EXAMINER